FOUR NEW SPECIES OF *ANTIPORUS* SHARP (COLEOPTERA, DYTISCIDAE) FROM AUSTRALIA, WITH NOTES ON *A. FEMORALIS* (BOH.) AND *A. INTERROGATIONIS* (CLARK)

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WATTS, C. H. S., 1997. Four new species of *Antiporus* Sharp (Colcoptera, Dytiscidae) from Australia, with notes on *A. femoralis* (Boh.) and *A. interrogationis* (Clark). *Records of the South Australian Museum* **30**(1): 35–42.

Four new species of *Antiporus* are described from Australia: *A. jenniferae* sp. nov., *A. hollingsworthi* sp. nov., *A. willyamsi* sp. nov. and *A. pembertoni* sp. nov. The distribution of *A. femoralis* (Boh.) and *A. interrogationis* (Clark) in Australia is reviewed. A key to the Australian species is provided.

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Thc spccics of *Antiporus* were last revised by Watts (1978) who recognised six species. In 1984 Brancucci (1984) resurrected *A. interrogationis* (Clark) from synonymy with *A. femoralis* (Boh.). In this paper I take the opportunity to describe four additional species of *Antiporus* Sharp from Australia and to review the distribution of *A. femoralis* (Boh.) and *A. interrogationis*. One of the new species, *A. jenniferae*, is closc to *A. simplex* Watts, one, *A. willyamsi*, has unusual sexual hairs on the front and middle trochanters and the other two bclong to a group of dark coloured *Antiporus* with enlarged metafemora in thc malcs (*A. femoralis, A. interrogationis, A. wilsoni* Watts, *A. hollingsworthi* n. sp. and *A. pembertoni* n.sp.). Males of this *A. femoralis* group are easily separated on the shapes of thc metafemur, proclaw and aedeagus. Females are difficult to distinguish, other than *A. interrogationis* which can be recognised by the colour on the pronotum.

The new spccics arc rare in collections, although this may in part reflect a lack of collecting particularly in south-west Australia.

The collections from which specimens werc examined are listed under the following abbreviations:

AM Australian Museum, Sydney.
ANIC Australian National Insect Collection, Canberra.
BMNH Natural History Museum, London.
MV Museum of Victoria, Melbourne.
SAMA South Australian Museum, Adelaide.
WAM Western Australian Museum, Perth.
UQIC Entomology Department Queensland University, Brisbane.

Systematics

Key To Australian Species Of *Antiporus* Sharp

1 — Protarsus with 2 claws ..... Females 2
— Protarsus with 1 claw ..... Males 10

2 — Relatively largc (> 6mm), predominantly reddish-yellow, elytra with 5–6 often incomplete long dark lines .... *A. gilberti* (Clark)
— Not with above combinations of characters 3

3 — Protarsi black. Relatively small (<4mm) .. .. *A. jenniferae* sp. nov.
— Protarsi reddish-yellow, same colour as rest of leg 4

4 — At least the basal segment of mesotarsi enlargcd in comparison with protarsi 5
— Segments of mesotarsi similar to those on protarsi or smaller 6

5 — Elytron with small and large punctures, all mesotarsal segments larger than those of protarsi, elytra with lighter streaking in younger specimens ... *A. willyamsi* sp. nov
— Elytra with uniform punctuation, only basal segment of mcsotarsi enlarged, elytra uniformly dark red-brown to black . ..... *A. wilsoni* Watts

6 — Smaller (< 3.5mm) 7
— Larger (>3.5mm) 8

7 — Elytron dark, usually with three reddish-yellow spots, pronotum reddish-yellow with dark front and rear borders ..... *A. bakewelli* (Clark)

— Elytron and pronotum uniformly red-brown..... *A. simplex* Watts

8 — More or less uniformly dark reddish-brown, elytron tip often appears truncated ..... *A. blakei* (Clark)

— Elytra normally black with or without lighter markings. Tip of elytron pointed . 9

9 — Black portion in centre of pronotum not reaching front border .... *A. interrogationis* (Clark)

— Black portion in centre of pronotum reaching front border .... *A. hollingsworthi* sp. nov. (W.A. only), ?*A. pembertoni* sp. nov. (W.A. only, female unknown), *A. femoralis* (Boh.)

10 — Prominent cup-like tuft of long golden setae on mesotrochanters (Fig. 28). Segments of mesotarsus larger than segments of protarsi .... *A. willyamsi* sp. nov.

— Mesotrochanters without such a tuft of setae. Segments of mesotarsus smaller than those of protarsus 11

11 — Metafemur produced on inside near apex 12

— Metafemur simple 13

12 — Relatively large (>6 mm), predominantly reddish-yellow, elytron with several long black lines. Metafemur with prominent narrow triangular process on inside near apex ..... *A. gilberti* (Clark)

— Predominantly dark-brown to black. Metafemur broadly produced on inside near apex 16

13 — Larger (length > 4.5 mm). Mesotibia strongly triangularly produced in middle on outside ..... *A. blakei* (Clark)

— Smaller (length < 3.7 mm). Mesotibia simple or thickened and angular but never as above 14

14 — Protarsi black in contrast to red-brown colour of rest of leg .... *A. jenniferae* sp. nov.

— Protarsi reddish-brown, same colour as rest of leg 15

15 — Elytron unicolorous, except for slightly paler sutural region and sides. Metacoxal lines evenly diverging anteriorly. Claw on protarsus relatively straight, with small basal tooth (Fig. 21) .... *A. simplex* Watts

— Elytron with one or more pale patches. Metacoxal lines much less divergent in anterior quarter than in middle. Claw on protarsus sickle-shaped, with large basal tooth (Fig. 18) ..... *A. bakewelli* (Clark)

16 — *A. femoralis* complex. The species are best separated by characters of the aedeagus and metafemur given in Figs 1–15. In addition the black portion in the centre of the pronotum does not reach the front border in *A. interrogationis* whereas it does in the other species.

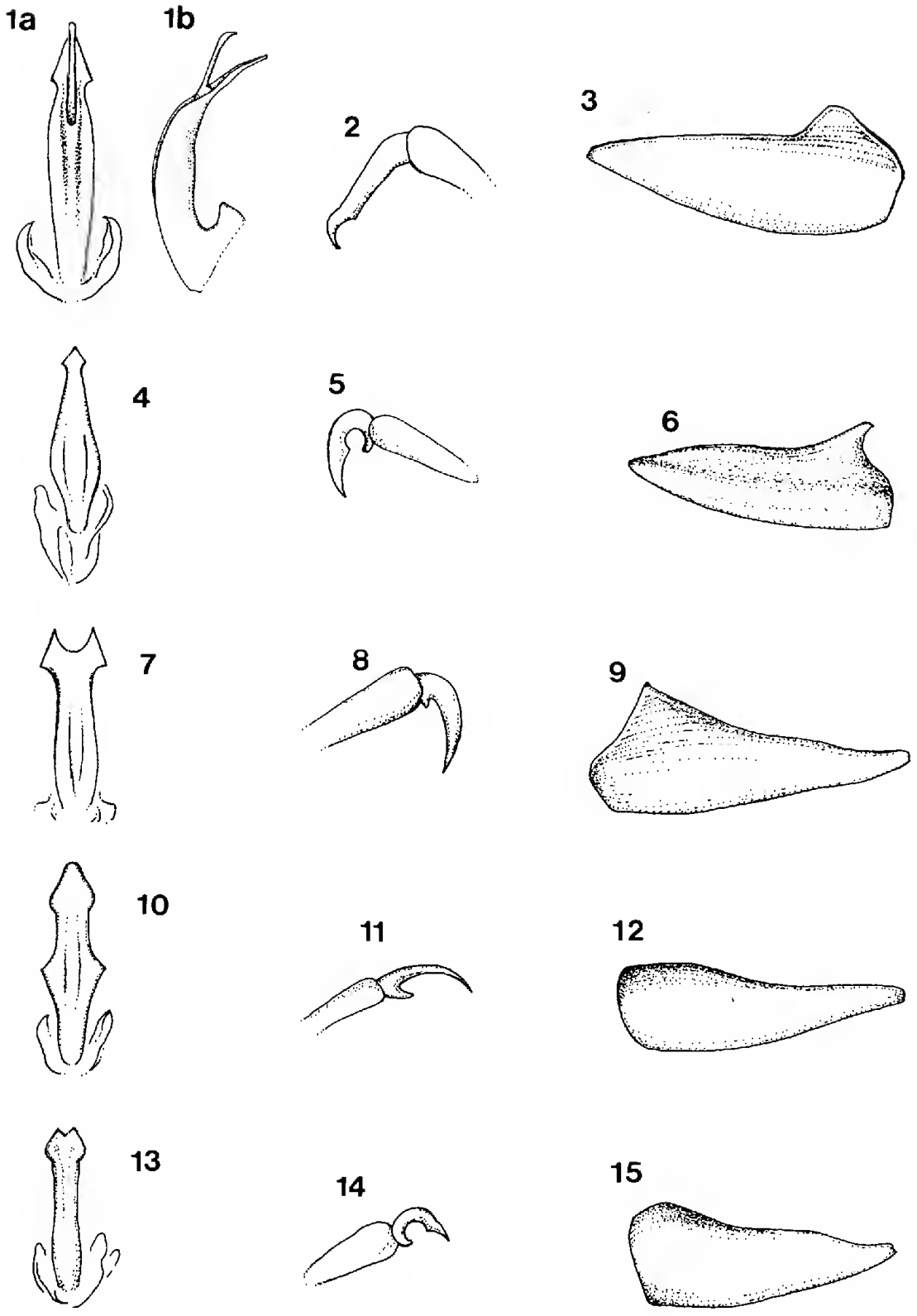
Antiporus femoralis (Boheman, 1858)
(Figs 7, 8 & 9)

Number examined, 83.

Brancucci (1984) clarified the relationships between this widespread and common species and *A. interrogationis* (Clark). It can be separated from this species by characters of the aedeagus and metafemur and in having the dark patch on the middle part of the pronotum reaching the anterior border. In this last character it is similar to the other members of the *A. femoralis* group. It differs from these in characters mentioned under the different species and illustrated in the figures.

Distribution

Australian Capital Territory: Black Mountain, ANIC; Hackett, ANIC; Mt Coree, ANIC; O'Connor, ANIC. **New South Wales:** Allyn River, ANIC; Galston, ANIC; Queanbeyan, ANIC; Sydney, MV, ANIC; Waratah, SAMA; Williams River, ANIC. **South Australia:** Beachport, AM; Eyre Peninsula, SAMA; Kangaroo Island, SAMA; Lucindale, SAMA; Port Lincoln, AM, SAMA. **Tasmania:** 11 km NNW Blackland, ANIC; Eaglehawk Neck, AM; Georgetown, MV; Hobart, MV; Launceston, MV; Liffey Valley, ANIC; Waldheim, UQIC. **Victoria:** 4 km W. Ballan, MV; L. Barracoota, MV; Cape Otway, MV;10 km NW Dartmouth Dam, MV; La Trobe, SAMA; L. Learmonth, ANIC;10 km NW



FIGURES 1–15. **1a**, dorsal view of aedeagus of *A. hollingsworthi*; **1b**, lateral view of aedeagus of *A. hollingsworthi* showing apical appendage; **2**, proclaw of male *A. hollingsworthi*; **3**, postfemur of *A. hollingsworthi*. **4**, dorsal view of aedeagus of *A. interrogationis*; **5**, proclaw of male *A. interrogationis*; **6**, postfemur of *A. interrogationis*. **7**, dorsal view of aedeagus of *A. femoralis*; **8**, proclaw of male *A. femoralis*; **9**, postfemur of *A. femoralis*. **10**, dorsal view of aedeagus of *A. pembertoni;* **11**, proclaw of male *A. pembertoni*; **12**, postfemur of *A. pembertoni*. **13**, dorsal view of aedeagus of *A. wilsoni*; **14**, proclaw of male *A. wilsoni*; **15**, postfemur of *A. wilsoni*.

Lexton, MV; Montmorency, SAMA; Mt Buffalo, MV; Mudgee, ANIC; Myrtleford, MV; Oakleigh, MV; Reservoir, MV; Werribee, MV. **Western Australia:** 9 mi NE by E Esperance, ANIC; Geraldton, MV; King George Sound, ANIC; Mullewa, SAMA; Ravensthorpe, ANIC; Stirling National Park, ANIC; Swan River, SAMA; Wilga, ANIC.

Antiporus interrogationis (Clark, 1862)
(Figs 4, 5 & 6)

Number examined, 62.

As pointed out by Brancucci (1984), *A. interrogationis* is clearly distinct from *A. femoralis* with which I had previously synonymised it (Watts 1978). Apart from the aedeagus (Fig. 4) and metafemur (Fig. 6), *A. interrogationis* differs from the other members of the *A. femoralis* group by the dark patch on the middle part of the pronotum usually not reaching the anterior border.

Distribution

Australian Capital Territory: Black Mountain, ANIC; Paddy's River, ANIC. **New South Wales:** 37 km E Hay, SAMA. **South Australia:** Naracoorte, UQIC. **Victoria:** 4 km W Ballan, MV; Bright, SAMA, MV, AM; Buninyong, MV; Delatite, MV; Delley's Dell Grampians, SAMA; Dividing Range, SAMA; Eltham, MV; Glen Valley, MV; Hamilton, MV; L. Purrumbete, MV; L. Wendouree, MV; Linga, MV; Melbourne, ANIC, MV; Merrimans Creek, MV; Mitta Mitta River, MV; Montmorency, SAMA; Mt Buffalo, SAMA; Nelson, SAMA; Noorinbee North, MV; Six Mile Creek Dartmouth, MV; 8 km NE Toolangi, MV; Warburton, MV; Werribee, MV; Yarra River, MV; Yarrawonga, MV.

Antiporus jenniferae sp. nov.
(Figs. 25, 26 & 27)

Description (number examined 63).

Length 3.4–3.6mm. Oblong-oval, convex, widest behind middle, elytron somewhat elongate posteriorly, tip sharp. Reddish yellow, portions of elytra a bit darker, sutural lines narrowly darker and bordered with pale strip, apical portions lighter; protarsi darker almost black in some specimens. Strongly, densely, and evenly punctured throughout. Pronotum and elytron narrowly margined, elytron moderately serrate towards apex, except for short distance near tip. Apical segments of both maxillary and labial palpi weakly bifid at tips. Prothoracic process narrowly lanceolate, rounded, almost keeled in cross section, slightly narrowed between procoxae. Metacoxal lines raised, moderately separated, diverging slightly posteriorly, widening to about twice their narrowest width anteriorly. Some long setae arising from pit in centre of sternite numbers three and four. A line of long setae towards sides of elytron.

Male: Pro- and mesotarsi moderately expanded, first and second segments as long as wide, claw on protarsus thickened, strongly bent near base, abruptly narrowing to sharp point at apex, with large basal tooth. Mesotibia robust, broadly but weakly indented on inner side in middle. Seta tufts on mesotrochanters somewhat thicker than on female.

Female: Mesotarsi a little expanded, protarsi less so. Protarsus with two simple claws.

Remarks

A. jenniferae can be distinguished from all other *Antiporus* by its relatively small size, and its black protarsi. It appears closest to *A. simplex* and *A. bakewelli*. From *A. simplex* it differs by its black protarsi, elytral colour pattern which although less marked than in *A. bakewelli* is clearly present, the aedeagus having a broader tip and widening slightly in the middle compared with the more parallel-sided aedeagus in *A. simplex* and the spine at the base of the claw on the male protarsi being larger than in *A. simplex*. Based on the small numbers of specimens of both species available it appears to be a little larger. From *A. bakewelli* it differs in its black protarsi, less marked and more diffuse elytral colour pattern, the aedeagus with a broader tip, and the claw on the male protarsi being straighter in comparison with the smoothly sickle-shaped claw of *A. bakewelli*.

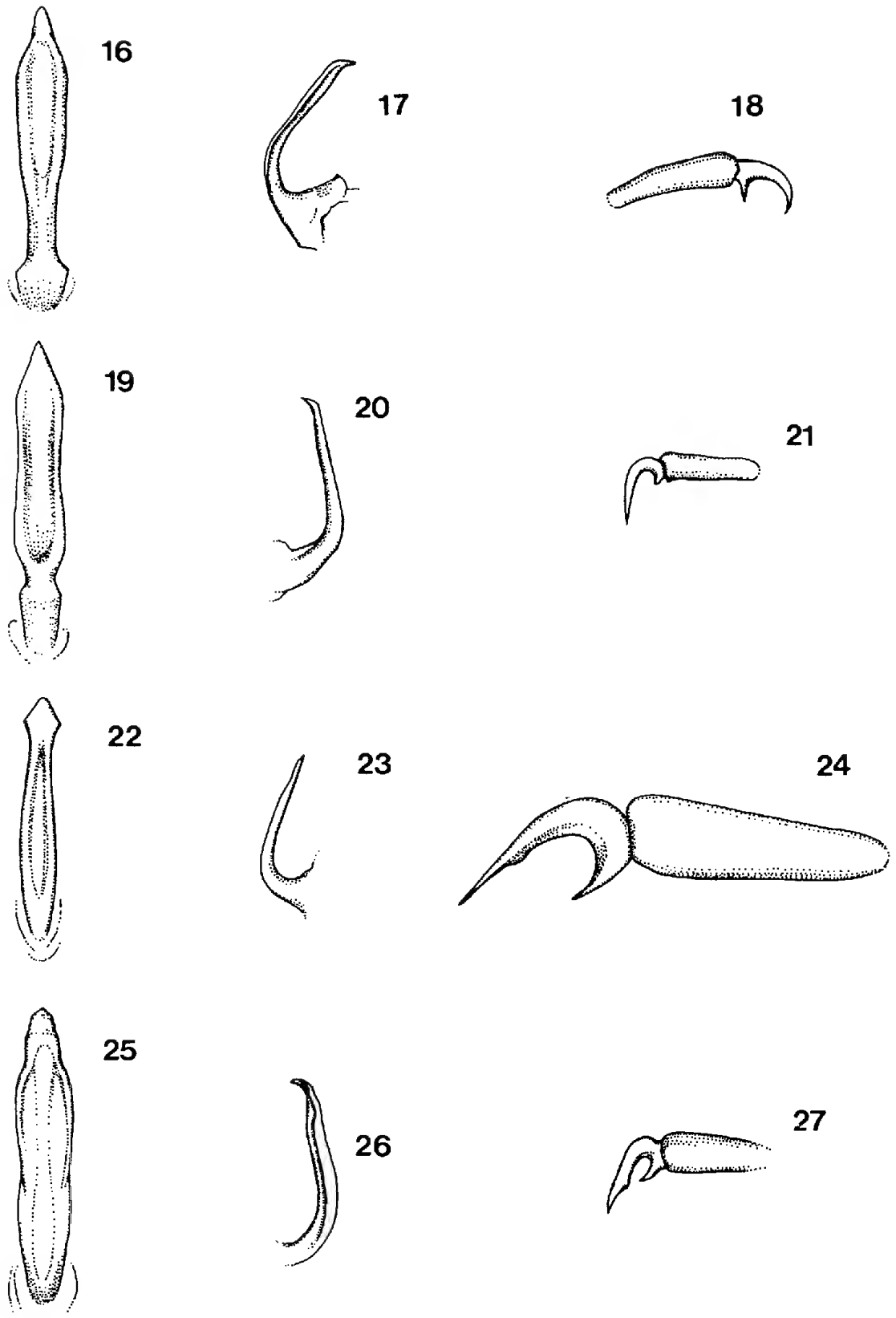
Distribution

Most specimens are from Cape York Peninsula, but it is also known from Adelaide River, N.T. (in BMNH) and Synnot Creek in northern W.A. (in ANIC).

Types

Holotype male: "25K. N. Coen Qld. 29/9/84 C. Watts" in SAMA.

Paratypes: 1, "12.40S 142°40E Qld Batavia Downs Hmsd. 17–23 Jun. 1992 T.A. Weir, at



FIGURES 16–27. **16 & 17**, dorsal and lateral view of aedeagus of *A. bakewelli*; **18**, lateral view of male *A. bakewelli* proclaw. **19 & 20**, dorsal and lateral view of aedeagus of *A. simplex*; **21**, lateral view of male *A. simplex* proclaw. **22 & 23**, dorsal and lateral view of aedeagus of *A. willyamsi*; **24**, lateral view of male *A. willyamsi* proclaw. **25 & 26**, dorsal and lateral view of aedeagus of *A. jenniferae*; **27**, lateral view of *A. jenniferae* proclaw.

light", in ANIC; 2, "12.40S 142.40E Batavia Downs Qld 03–10 Mar 1993 at light, I. Cunningham", in ANIC; 1, "16.31S 126.1E CALM site 25/1 Synnot Ck W.A. 17–20 June 1988 T.A. Weir", in ANIC; 11 "25k N. Coen Qld 29/9/85 C. Watts", in SAMA; 1, "24M.S. Musgrave N.Q. 20.5.72 J.C. Brooks at light", in ANIC; 1, "13.34S 142.32 E Qld, 17 km N.W. by W. of Rokeby (Vardons Lagoon) 27 Oct. 1992, T. Weir, P. Zborowski, Small pool with debris", in ANIC; 56, "Qld Mt. Molloy 2 km S. 30/3/96, C. Watts", in SAMA.

Antiporus pembertoni sp. nov.
(Figs 10, 11 & 12)

Description (number examined 1).

Length 4.6mm. Oblong oval, dark red brown – black, front of head, sides of pronotum broadly and sides of elytron narrowly but diffusely light-testaceous. Ventral surface testaceous, sides of meso and metasterna darker, apical tips of metatibiae darker. Dorsal surface rather finely punctured, stronger laterally, punctures on head a little smaller than eye facets, punctures at rear of pronotum towards sides and on adjacent areas of elytra tending to join in roughly longitudinal lines. Ventral surface much more strongly punctured, strongly rugose-punctate laterally. Pronotum narrowly but clearly margined, elytron weakly so. Prothoracic process narrow, strongly raised, sides sub-parallel, bluntly tipped. Metacoxal lines well separated, sub-parallel in posterior third and anterior quarter, diverging in between so that anteriorly about twice the distance apart as posteriorly, area between coxal lines and forward onto mesosterum depressed.

Male: Protarsi moderately expanded, protarsal claw large, slender, with well developed slender basal tooth. Mesotibia weakly indented on inner margin towards apex. Metafemur broadly expanded on inner edge at apex, some strong punctures and weak longitudinal ridging on expanded area.

Female: Unknown

Remarks

More weakly punctured than the other species in the *A. femoralis* complex, with the large punctures along the front of the pronotum distinct and more than twice the size of others on the pronotum. Characters of the male aedeagus and metafemur are diagnostic. Known only from a single specimen 1 collected in a small stream in cleared land near Pemberton.

Distribution

Known only from unique type from near Pemberton, S.W. Australia.

Type

Holotype male: "W. Aust. 15 km N.W. Pemberton, 17 May 1987, C. Watts" in SAMA.

Antiporus hollingsworthi sp. nov.
(Figs 1, 1a, 2, & 3)

Description (number examined 15).

Length 4.1–4.6mm. Oblong oval, convex. Dark red-brown, appendages lighter. Strongly evenly and densely punctate throughout, punctures smaller on head than elytra, punctures at rear of pronotum towards sides and on adjacent areas of elytra tending to join in linear longitudinal lines, punctures towards sides of metacoxae and sternites and on elytral epipleura very close together and tending to coalesce. Pronotum and elytra narrowly margined except for short distance at tips of elytra, lacking serration, sides of elytra before apex appear weakly and broadly flanged from some angles. Prothoracic process narrow, blunt, strongly carinate. Metacoxal lines sub-parallel in anterior and posterior third, rapidly diverging in middle.

Male: Pro- and mesotarsi moderately expanded. First and second segments wider than long. Claw on protarsus strongly bent near base, straight with parallel sides in middle, rapidly narrowing at apex basal tooth subobsolete. Mesotibia a little thickened, weakly and broadly indented on inner edge in middle. Apical ventral edge of mesofemur expanded a little. Inner ventral edge of metafemur with large, broad, triangular expansion in apical third. Parameres robust, broad, aedeagus arrow-headed with thin protuberance above tip arising from neck of arrow.

Female: Pro- and mesotarsi a little expanded; claws, meso- and metafemur and tibia simple.

Remarks

Antiporus hollingsworthi is a member of the *A. femoralis* group. It appears closest to *A. wilsoni* from the south-east of Australia which it resembles in the pronotal and elytral grooving, thickened male mesotibia and expanded metafemur.

Antiporus hollingsworthi can be separated from both *A. femoralis* and *A. interrogationis* by the lack of pronounced paler areas on the head, pronotum and elytra, although some specimens of

A. hollingsworthi do have head, pronotum and elytral patches paler than the rest of the upper surface. The tendency of the punctures on the rear edge of the pronotum and the adjacent areas on the elytra to link up and form grooves is more pronounced than in either *A. femoralis* or *A. interrogationis* and the triangular expansion on the male metafemur is more rounded than in either of these species. *A. femoralis* and *A. interrogationis* also lack the thickened and indented mesotibia present in *A. hollingsworthi*, *A. wilsoni* and to a lesser extent in *A. pembertoni*. *Antiporus hollingsworthi* is more strongly punctured than *A. pembertoni* and the males have differently shaped metafemora (Fig. 3). It differs from *A. wilsoni* by characters of the aedeagus, by the indentation on the male mesotibia being more central, and in having a triangular rather than a rounded expansion to the male metafemur. *Antiporus hollingsworthi* differs from all other *Antiporus* species (and all Australian Dytiscidae) by the apical appendage on the aedeagus.

Distribution

So far *A. hollingsworthi* is known only from Perth and Carrington, W.A. and from two unlocalised localities in the South-west. However, of all the Australian regions this is the most poorly sampled for water beetles so it is likely to be more abundant than the few known specimens indicate.

Types

Holotype male: "W. Aust. Maidavale, 27th April 1990, C. Watts", in SAMA.

Paratypes: 1 male, 7 females, same data as Holotype, in SAMA; 1 female "Perth 10/65 DE", in SAMA; 1 female "S.W.A. ?Rotnest, Edward", in SAMA; 1 male "JT201", in SAMA; 1 male, 1 female "R.P. McMillan, Carrington, 19.7.53", in WAM.

Etymology

Named after Rod Hollingsworth, a strong supporter of Natural History at the South Australian Museum.

Antiporus willyamsi sp. nov.
(Figs 22, 23, 24 & 28)

Description (number examined 4).

Length 3.4–3.6 mm. Oblong-oval. Widest behind middle. Testaceous, head, lateral quarters of pronotum, patches on elytra and appendages lighter, metafemur and tibia tend to be a little darker towards their apices, lighter patches on elytron tending to form broad longitudinal streaks. Strongly, densely and evenly punctate, punctures on discs of pronotum and head weaker, particularly on head, a few scattered much smaller punctures on disc of pronotum and elytra. Pronotum narrowly but distinctly margined, elytra less so. Prothoracic process with central keel, narrow between procoxae. Metacoxal lines raised, sub-parallel in posterior half and anterior quarter, diverging in between, about twice the distance apart anteriorly compared with posteriorly, reaching mesofemur. Some long setae arising from pits in centre of sternites three and four, and a line of long setae on dorsal surface of elytron close to side.

Male: Protarsi expanded, second segment broadest, mesotarsi strongly expanded, first and second segments largest, sub-equal. Mesofemur and mesotibia stouter than profemur and protibia. Protarsus with single claw, strongly bent, long and narrow, with well developed basal tooth and weak bulbous area in middle. Protrochanters with well marked cup-like tuft of golden setae, mesotrochanters with a much larger scallop-shaped tuft of similar setae. Metafemur stout, ventral inner apical region with scattered large punctures and about four longitudinal grooves/ridges.

Female: Protarsus with two weak claws. Mesotarsi moderately expanded, first and second segments largest, sub-equal. Mesotibia stout.

Remarks

The species is easily recognised by the spectacular development of the setae on the trochanters of the male which is unlike anything I

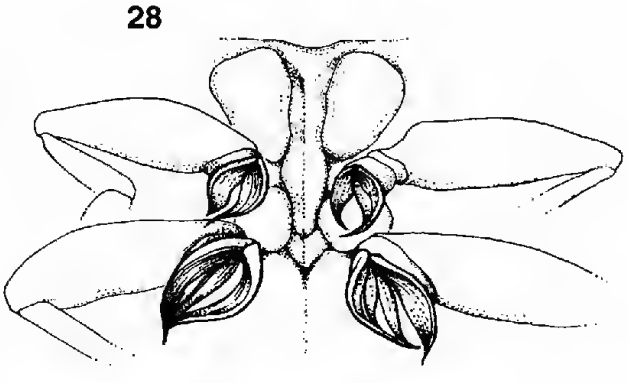


FIGURE 28. Meso- and metatrochanters of *A. willyamsi*.

have seen on other beetles. The very broad mesotarsi in the male and the striped elytral colour pattern in teneral individuals are also distinctive.

Since collecting the original specimens in 1983, I have revisited the locality (a deep, narrow, spring-fed drainage ditch in acidic soil) a number of times without success. Biologically the area has now changed considerably from a healthy habitat with numerous species to one that is almost devoid of insect life although physically little changed.

Distribution

Known only from the type locality in the south-east of South Australia and from Healesville, Victoria.

Types

Holotype male: "10 km S. Robe, S.A., 1/83, C. Watts", in SAMA.

Paratypes: 2 females, same data as holotype, in SAMA; 1 female, "Healesville, V. 12/68, C. Watts", in SAMA.

Checklist Of Australian *Antiporus* Sharp

A. bakewelli (Clark, 1862)
A. blakei (Clark, 1862)
A. femoralis (Boheman, 1858)
A. gilberti (Clark, 1862)
A. hollingsworthi sp. nov.
A. jenniferae sp. nov.
A. pembertoni sp. nov.
A. simplex Watts, 1978
A. willyamsi sp. nov.
A. wilsoni Watts, 1978
A. interrogationis (Clark, 1862)

Acknowledgments

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